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## The Chestnut-Tree.

THE Chestnut-tree differs from other trees of the northern hemisphere in the fixedness of its characters. The descendant in direct line of a species which flourished in the Tertiary Period in circumpolar Arctic regions, and which later was widely distributed through the northern hemisphere, it has been affected less during the existing geological era by the surroundings of its home in the three continents than other widely distributed trees; and the Chestnut-tree of North America, the Chestnut-tree of the mountains of the Mediterranean Basin and of the Caucasus, and the Chestnut-tree of Japan, are so nearly identical in all the characters which distinguish one species from another that they may be regarded as the same tree. Other trees of similar ancestry, and especially its nearest botanical relative, the Oak, have varied more or less as their surroundings have favored the development of varied forms, and now the Oaks, the Elms, the Walnuts, the Poplars, the Willows, and the other trees peculiar to the northern hemisphere, have all adapted themselves, by the slow development of new forms, to support the altered conditions which have accompanied the topographical and climatic changes to which the earth has been subjected.

That the Chestnut-tree did not share with other plants to the same degree the power of adapting itself to the altered conditions in which it was placed through the advent and retreat of the coating of ice which covered so much of the northern hemisphere during the Glacial Period, will account, perhaps, for the comparatively restricted area which the genus now occupies and the paucity of its forms.

In North America the Chestnut-tree is confined to the Appalachian region, reaching the coast of New England and the middle states and the northern shores of Lake Ontario; it does not extend into the Florida-peninsula or extend west beyond the hilly region of middle Kentucky and Tennessee. There occurs, however, in North America, where it is endemic, the second species of the genus. This is the Chinquapin (*Castanea pumila*), which has a wider range than the true Chestnut has on this continent, although it does not grow naturally north of Pennsylvania. It extends, however, into Florida and west of the Mississippi River, where it attains its greatest development. Remnants of what is believed to have been the ancestor of this second species of Chestnut have been recognized in the Tertiary formation of Alaska.

The Chestnut has been so generally cultivated in Europe for centuries that it is not easy to determine how much of its actual distribution there is due to the immediate action of man. It was at one time supposed that the home of the Old World Chestnut was confined to the trans-Caspian regions, and that the Greeks and then the Romans had carried it into Europe. There is reason to suppose, however, that the forests of this tree which cover here and there the mountain ranges from Portugal to the Caspian represent an indigenous growth, a view which would seem to be strengthened by the fact that such forests exist also on some of the mountains of Algeria, where it is hardly probable that the Chestnut-tree was ever cultivated to the extent which the entire naturalization of the species would imply. The Chestnut is common in central Europe as far north as Britain; but it is reasonably certain that it was carried there by man in comparatively recent times. West of the Caucasus there is a long stretch where the Chestnut-tree has not secured a foothold. It is not found in the forests of the Himalaya or in China, although it is more than probable that further investigation of the flora of the mountain regions of the western part of the empire will bring to light the presence of forests of Chestnut-trees similar to those which occur in Japan.

The Chestnut for centuries has been one of the most valuable food-producing trees of Europe, and the most careful attention has been paid in Italy and France to developing the size and improving the quality of the fruit. The Romans, in Pliny's time, distinguished eight varieties of chestnuts, and now the number of recognized varieties is very large. The cultivated chestnuts are divided into two classes, known in France as Marrons and Chataignes, the latter bearing about the same relation to the former as the crab-apple does to the apple. Marrons are larger, more farinaceous, and much sweeter and more aromatic than the ordinary chestnut, and are the result of careful selection and cultivation, which has been going on for centuries. Marrons of the best quality are produced in central and southern France, although it is in Italy that the chestnut is more used as an article of food than in other parts of the world.

The Chestnut must be considered one of the most important North American deciduous trees, although several others grow over a much larger area and some of them attain to larger dimensions and produce more valuable timber. The Chestnut-tree, however, grows in America to a respectable size, and specimens often occur on the slopes of the southern Alleghany Mountains with trunks four or five feet in diameter. It is never, however, a very tall tree here, rarely attaining the height of a hundred feet. The trunk is generally short, dividing at a distance of twenty or thirty feet from the ground into stout spreading branches, which form a handsome, compact round head. The habit of the tree is well shown in the illustration on page 359, which represents two characteristic Chestnut-trees, as this tree often appears on the hill-sides of New England.

The fruit of the American Chestnut is small, but very sweet, and it shows a tendency to vary considerably in size and quality, showing that time and care only are needed to produce varieties which will equal in value the best Marrons of France. The production here of the best varieties of chestnuts, however, can be obtained much more quickly by the introduction into the country of European varieties than by the slow process of selecting and developing the native fruit. The European Chestnut, to be sure, is not perfectly hardy in the northern parts of the country, but it flourishes, however, and produces its fruit in the middle and southern states. The population of North America is still too scanty and food is too abundant here to make the cultivation of the Chestnut-tree on any large scale a practical undertaking at present; but the time

will come when the mountain-sides of all the Alleghany region, from Pennsylvania to Georgia, will find their most profitable employment in the production of chestnuts for food. There is no part of the world which is better suited for the purpose, or one in which the Chestnut-tree flourishes with greater luxuriance.

The Chestnut-tree, too, produces wood of great value. Chestnut is one of the American woods best able to withstand the effects of decay when placed in the ground. This makes it one of the best woods for fence-posts, and it has no superior for railroad-ties, for which purpose, especially in New England, it is largely used. It is also used sometimes in cabinet-making. The coarse grain and large open ducts peculiar to this wood unfit it, however, for this purpose, and it is now less generally used than it was formerly in this way or in the construction of dwellings.

The value of the Chestnut as a timber-tree is increased by the fact that the stumps of cut trees have unusual power of producing shoots which soon form trunks large enough for posts and railway-ties, so that a forest of Chestnut-trees may be cut over every thirty or forty years and continue productive during several generations. The American Chestnut possesses a great deal of value as an ornamental tree. It grows rapidly even in light, porous drift, and soon makes a handsome round-headed specimen. It is very beautiful when it is covered early in July with its showy yellow flowers, whose odor some people find, however, extremely disagreeable. Few insects prey upon its handsome glossy foliage, and the fruit, which grows and ripens in the short period of about two months and a half, possesses, even in its unimproved condition, considerable money value.

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The Census of this year naturally suggests the subject of the increasing density of population in this country, and it is encouraging to see any disposition to recognize and consider difficulties and problems which may arise from this source. Until very recently the people of this country have been unwilling to admit the necessity of foresight or self-restraint in any direction. Wastefulness has been regarded as an indication of broad and generous qualities, and it has become a prominent feature in the national character. All our possessions have been considered inexhaustible and have been treated accordingly. We have slaughtered and devastated whatever belonged to the nation, our soil, forests, fish and game, out of mere wanton destructiveness and folly worse than barbaric.

We shall reap what we have sown. When forest-conditions are destroyed on mountains and hills, and the soil has been swept away in consequence, it can never be restored. We live in a world where means and conditions are necessary for the production of results, and we might as well at once begin to depend upon calling our food out of the air by magic as to expect that an unlimited population will be able to obtain the means of subsistence from soil of which the fertility is steadily diminishing.

A recent writer says that the point of the whole matter is that the children of the public schools should be taught the necessity of better cultivation of the land on account of the prospect that in the future population is likely to press upon the means of subsistence. He thinks if this is done we may rest content for the future, because the Anglo-American race has shown itself equal to the solution of all the problems it has ever been called to face. But if the people of this country would begin the practice of such methods of living as are required by the conditions and circumstances of our own time, it would probably have a better effect on the children than any amount of theoretical teaching in the schools. What good will it do to talk to the children about the forestry interests of the future when they see around them every day the prevailing barbarism, the general disregard of the very things which they are told they should attend to when they are grown up? Until our towns begin to treat groves and trees along the roadsides and in other public places in a civilized manner, until the different states and the nation adopt a policy of intelligence in dealing with public forest-interests mere talk in the schools about forestry and agriculture would have little value or vitality. We can hardly hope to escape from the obligation to act sensibly and decently ourselves in the present, in our treatment of these great, important matters, by establishing in the schools instruction regarding what should be done in the future. The time for action has already come, and the need for it is pressing. Example is the best teaching. But it is easier to talk about the duty of another generation than to perform our own.

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## The Preservation of Natural Scenery.

Some weeks ago we gave an account of a meeting held in Boston to secure the preservation of beautiful and historical places in the state of Massachusetts through a board of trustees empowered to acquire real estate which possesses natural attractiveness and historical interest and to hold this free of taxes for public use. Mr. Charles Eliot added a report upon this proposition, which covered the question so thoroughly that we will do our readers a service by presenting a brief abstract of it. It set out with the assumption that all were agreed upon the value to a crowded community of easily accessible scenes of natural beauty and romantic interest; that cultivated people had none of that selfish feeling which sometimes suggested that it might be preferable to allow a favorite grove or brook-side to be destroyed rather than to help open it to the enjoyment of the "vulgar throng"; that everybody desired to see as many refreshing and interesting spots as possible dedicated to the public enjoyment of our own and future generations. England is strewn with public commons and public forests which are the remnants of ancient royal hunting parks. Moreover, public foot-paths everywhere lead across private land, and many of the grandly wooded estates of the country are open to all who care to enter. Every town has some attractive place of common assemblage, such as the river banks at Lincoln or Durham, the castle grounds at Ludlow or the city walls in Chester. In short, no such problem confronts the people of England as that which faces the men of Massachusetts. Even the French Republic maintains public forests and the once imperial gardens and palaces with a care which is hardly excelled in imperial Germany. New England once possessed considerable commons, but they have long since been appropriated to private use.

There is a Public Forest Act which may help to secure large tracts of land for the enjoyment of the people, as it already has done in the city of Lynn, where a wilderness of 1,500 acres has been converted into a Commonwood, and under this act it is hoped that the towns which surround the Middlesex Fells may secure as large a tract as the Lynn Public Forest. But no easy way exists at present by which small bits of natural scenery and single buildings or sites of uncommon interest can be dedicated to public use. These places might be taken by towns under the Park Act, but the government of a Yankee town is not always adapted to the maintenance of trusts which require good taste and permanent policy. The desired result could be reached by a special act of the Legislature as was done in the case of the old South Church in Boston and by the inhabitants of Cazenovia, New York, in order to secure the gorge and falls of the Chittenango. But the necessity for special laws and the organization of special boards discourage and hinder those who have this cause at heart, and, therefore, the plan of a single board of trustees for the whole state was proposed by the committee.

Scattered throughout the state are thriving historical and antiquarian societies and other associations which have already saved some memorable places. The Essex Institute has purchased a great boulder called the Ship Rock. The Old Colony Natural History Society owns Dighton Rock and the Worcester Natural History Society owns part of the shore of Lake Quinsigamond. If these societies, with all other individuals who may be interested, should make appeal to the Legislature to establish one strong board of trustees, this concerted action would probably bring about the creation of the board; and the existence and action of this board would in turn stimulate local effort for the acquisition of desirable lands. On a similar plan some of the noblest institutions of the state have been maintained, like the Massachusetts General Hospital and the Boston Museum of Fine Arts. It may be asked whether the value of natural beauty and historical memorials is sufficiently understood in the state to encourage gifts of such a character to the trustees. The value of a hospital is recognized, but is the same true of the love of nature and of the historical past? This ques-

tion can only be answered by experiment and the committee have no doubt of the result.

It is encouraging to recall the fact that what is now desired to be accomplished throughout the state by a central board of trustees has already been gained in a suburb of Boston by the Board of Trustees of Harvard University. This board once acquired, by gift from Benjamin Bussey, a large tract of farm and wood land in Roxbury. By virtue of their charter, the Harvard trustees hold this land free of taxes; and when, in pursuance of the will of James Arnold, they established on a part of it a collection of all the trees and shrubs which will live in this climate, they made with the city of Boston the same bargain which it is now proposed to enable the suggested board of trustees to make with any town or city in the state. Harvard University opens the Arnold Arboretum to the public in return for police protection and the making of roads and paths.

## Unripe Seed.

AT this season of the year it may be desirable to call attention to some past work done at the New York Agricultural Experiment Station, which seems to have been strangely overlooked, important as it may be in furnishing clues and suggestions toward a method of attaining earliness and other changes in our cultivated vegetables. Last summer Professor Arthur, of Purdue University, gave me an oral account of the great success attained in earliness from the use of Tomato seed from the strain originated at Geneva from unripe seed, a strain for which we had many applications from practical growers; and perhaps Professor Goff may be induced to give to the public the results of his continuous work in this field.

In 1883 it was found that Flint Corn, Sweet Corn and Dent Corn, harvested before glazing, germinated freely, and that Peas planted while at the edible stage vegetated freely. (Report of 1883, 39.)

In 1884 ripe and unripe seeds of the Early Dutch Turnip were planted. Fifteen roots from the green seeds weighed on the average four and a half ounces each; thirty-four roots from the ripe seed averaged six ounces each. (Report of 1884, 199.)

Very green seeds of Cook's Favorite Tomato yielded ripe fruit in 126 days from planting; ripe seed yielded ripe fruit in 146 days from planting. The first ten ripe fruits were gathered in 137 days from the green-seed plants; in 152 days from the ripest-seed plants. For additional particulars the reference may be consulted. (Report of 1884, 224.)

Trials were made with three varieties of Peas. The first pods were ripe in the Blue Peter in sixty-eight days from both the ripe and unripe seed; in the case of the Eugenia in seventy-seven days from ripe seed, in seventy-two days from green seed; in the case of William the First in sixty-five days from the ripe seed, in eighty-four days from green seed. The number of pods per 100 plants varied from 629 to 467 between the plants of Blue Peter from ripe and those from green seed; from 706 to 677 for the Eugenia; from 300 to 1,600 for William the First. (Report of 1884, 232.)

In 1885 green seed gave heads of Danish Drumhead Cabbage ninety-seven ounces in weight; ripe seed seventy-five ounces. (Report of 1885, 154.) In Lettuce no difference was observed between green and ripe seed.

In the Tomato, a gain for the first ten fruits of a week was noted in favor of immature seed, in one case, and with another variety unripe seed produced fruit considerably earlier.

These references should be enough to turn attention to the experiments. The best results were with the Tomato. Here a gain of fifteen or twenty days in earliness was obtained, and this gain, as Professor Arthur tells me, has been maintained to date. A weakness in the plants has been a serious drawback, and while green seed seemed unfitted for immediate use by the grower, yet it is by no means certain but that this feebleness may be trained out by the experimenter. The trials were too few to attain certainty, but the great value to marketmen of an early strain of seed ought to encourage further tests. Why should not our experiment stations enter upon this interesting and promising inquiry?

South Framingham, Mass. *E. Lewis Sturtevant.*

## Is the Strawberry Improving?

THE history of the cultivated Strawberry, though short as compared with that of most of our fruits, is of especial interest as bearing upon fruit improvement. We have here a fruit that possesses such rare dessert qualities that it is a universal favorite, a fruit of which seedlings are grown with the utmost ease, and come very quickly into bearing, and of which several botanical species hybridize very readily, producing abundantly fertile offspring. All these facts have tended to concentrate the attention of amateur horticulturists upon the Strawberry, and it is not improbable that more seedlings of this fruit have been grown during the last half century than of all other fruits combined.

What has been the result? Has the Strawberry shown a continuous improvement during this period? Hovey's Seedling was introduced about 1834, and through its sterling merit soon became a standard. The last report of the American Pomological Society shows that this old favorite is still grown in sixteen states, and in only eight of the fifty-three tabulated varieties is it excelled in the number of its stars. The first supplanter of Hovey's Seedling in public estimation was the Wilson, of which the date of introduction seems to be lost. From the report just cited it appears that this variety is still grown in thirty-eight states, and the number of its stars surpasses that of the next highest by nearly 100 per cent. In 1872 Downing described 260 varieties of Strawberries, of which only eight were named in the last report of the American Pomological Society. The question which naturally follows is: Have any varieties developed since the last meeting of the American Pomological Society that are likely to surpass the Wilson in public esteem? It is true that this old standard is suffering seriously from disease in many localities, but where maintained free from disease it certainly has not yet been supplanted. Unwilling as we may be to admit it, these cold facts declare that since the appearance of the Wilson not one of the millions of seedlings that have been grown has surpassed it in excellence, all points considered.

Do these facts imply that further attempts at improving the Strawberry are useless? Not necessarily. It is much to be regretted that we do not know more of the history of our cultivated Strawberry. The common opinion of horticulturists and botanists appears to be that it is the result of a hybrid between our native *Fragaria Virginiana* and the *F. grandiflora* of South America. But by whom the importations of the latter were made or by whom the hybridizations were effected is not definitely known. If all the amateur Strawberry work of the past half century has been confined to the posterity of one or a few hybridizations between the two parental species, it is not strange if the limits of variation have been reached. Unless we accept the hypothesis that hybridization tends to reproduce all past variations within the parental families, it is possible that by securing new hybrids between the species that are the parents of our cultivated Strawberry, selecting specimens that show marked characteristics, the scope of variation might be very much extended. It is hardly probable that the original parents were selected with any great degree of care or wisdom, but the results have proved infinitely valuable. Possibly a more careful selection of parental types might give rise to much greater improvements.

The importance that the Strawberry has assumed as a commercial fruit is certainly sufficient to warrant a systematic series of experiments looking toward its further improvement, and in these days of experiment stations, why should not this be undertaken?

University of Wisconsin, Madison. *E. S. Goff.*

## Notes on North American Trees.—XX.

### Description of the Wood of Certain Species.

*Terminalia Buceras.* Wood exceedingly heavy and hard, compact and close-grained, containing numerous minute evenly distributed open ducts; layers of annual growth hardly distinguishable; medullary rays thin, very obscure; color light yellow-brown, sometimes slightly streaked with orange, the sap-wood clear pale yellow; specific gravity, 1.0490, 1.0322, average 1.0406; ash, 4.93, 4.84, average 4.89; weight per cubic foot, 64.85 pounds; fuel value, 0.9868. Collected by A. H. Curtiss and C. S. Sargent on Elliott's Key, Florida.

*Quercus tomentella.* Wood heavy, hard, close-grained, compact, satiny, containing broad bands of open ducts parallel with the broad, conspicuous medullary rays; color pale yellow-brown, that of the sap-wood rather lighter; specific gravity, 0.7187, 0.7240, average 0.7214; ash, 1.10, 0.90, average 1.00; weight per cubic foot, 44.95 pounds; fuel value, 0.7142.

*Cupressus MacNabiana.* Wood light, soft, very close-grained, compact, bands of small summer cells narrow, dark colored, conspicuous; medullary rays thin, obscure; color light brown, the sap-wood nearly white; specific

gravity 0.5503, 0.5647, average 0.5575; ash 0.61, 0.65, average, 0.63; weight per cubic foot, 34.74 pounds; fuel value, 0.5540. Collected by T. S. Brandegee in Lake County, California.

*Picea Breweriana.* Wood much heavier than that of the other North American species, soft, close-grained, compact, satiny; bands of small summer cells broad and conspicuous, resin passages broad, widely scattered, conspicuous; medullary rays thin, numerous; color very light brown or nearly white, the sap-wood hardly distinguishable; specific gravity, 0.5179, 0.5103, average 0.5141; ash, 0.44, 0.53, average 0.49; weight per cubic foot, 32.04 pounds; fuel value, 0.5116. Collected by T. S. Brandegee on the Siskiyou Mountains, Oregon.

*Larix Lyallii.* Wood heavy, hard, close-grained, compact, susceptible of a fine polish; bands of small summer cells broad, occupying from a third to a half of the layers of annual growth, very resinous, dark colored, conspicuous; resin passages few, obscure; medullary rays numerous, thin; color bright reddish brown, that of the sap-wood nearly white; specific gravity, 0.6785, 0.7369, average 0.7077; ash, 0.30, 0.25, average 0.28; weight per cubic foot, 44.10 pounds; fuel value, 0.7057. Collected by T. S. Brandegee in Washington Territory.

The wood of this species is intermediate in weight between that of the eastern Larch (*L. larcina*) and that of the western Larch (*L. occidentalis*), which surpasses in weight and strength the wood of any North American coniferous tree.

*Sabal species.* Wood exceedingly light, soft, fibro-vascular bundles broad, light colored, not very conspicuous; color light brown, tinged with red; specific gravity, 0.2679, 0.2534, average 0.2607; ash, 3.74, 3.63, average 3.68; weight per cubic foot, 16.25 pounds; fuel value, 0.2511; used for piles, wharves, etc. Collected by C. G. Pringle near the mouth of the Rio Grande in Texas.

*C. S. Sargent.*

## New or Little Known Plants.

### Æsculus Parryi.*

A DWARF Horse-chestnut detected on the shores of Todos-Santos Bay in April, 1882, by a party of botanists consisting of the late Dr. C. C. Parry, Mr. C. G. Pringle and Mr. Marcus E. Jones, was described under this name by Professor Asa Gray in the *Proceedings of the American Academy of Arts and Sciences* (xvii., 200). He pointed out the affinities of the plant, a low shrub, with the familiar Buckeye of California, which in many respects it closely resembles. The chief differences are found in the character of the calyx, which in *Æsculus Californica* is deeply two-lobed, the lobes being very slightly divided, while in *Æsculus Parryi* the campanulate calyx has five nearly equal lobes. These characters are constant in all the species I have examined, and I fail to find any intermediate form which would serve to connect the plant of Lower California with the California Buckeye, from which it differs also in its shorter inflorescence, its shorter pedicels, smaller flowers and fruit, and in the dense pubescence which covers the under surface of the small obovate leaflets, which are sessile, or generally nearly so. The fruit is unarmed, obovate, rather less than an inch long and broad, in the specimens I have seen, which are from one to three-seeded. The seed is a third of an inch in diameter.

This interesting plant (see page 357) has not been introduced yet into cultivation. *C. S. S.*

### The California Pæonias.

OUR continent seems to be popularly credited with only a single native species of Pæonia. In one of several valuable paragraphs on the genus by Mr. Watson, of London, published in a recent issue of GARDEN AND FOREST, I read the following in relation to America: "In the latter country *P. Brownii* is the only species that occurs wild."

The truth is, that we have two easily distinguishable species, both belonging to the Pacific slope of the continent, and both found within the limits of the extensive commonwealth of California, although inhabiting each its own peculiar climatic region, neither one intruding upon or even nearly approaching the territory of the other species. Neither one is of recent discovery; but in the herbaria of eastern America, as well as in those of Europe, if both species occur, authors have apparently confounded them. The names of the two, as well as their distinguishing marks, may be given thus:

*Pæonia Brownii*, Dougl. (Hook., Fl. Br. Am., i. 27.) Herbage glabrous and glaucous; leaves of ovate general outline, ternately divided into many short obtuse segments.

*Pæonia Californica*, Nutt. (Torr. & Gray, Fl., i. 41). Glabrous, but not glaucous; leaves twice or thrice as large, of rounded and pedate general outline—i. e., broader than long, divided into few lanceolate or oblong-acute segments.

*P. Brownii* inhabits the subalpine regions of the snowy mountains, from middle California northward through Oregon and Washington, flowering in June and July, often near banks of melting snow.

*P. Californica*, at its northern limit, is separated by 200 or 300 miles at least from the nearest habitat of its congener, flourishing in a climate almost as different as possible. It belongs to the hill country of southern and sub-tropical California near the sea, where snow never falls and where its shoots appear above ground and push into bloom soon after the first of the late autumnal rains.

From some of the specimens in my herbarium I suspect these plants will prove further distinguishable by different subterranean characters. While the vegetating shoots of *P. Californica* seem to arise immediately from the midst of a fascicle of (tuberous ?) roots not deeply seated in the ground, those of *P. Brownii* are attached to the summit of a thick, somewhat ligneous root-stock, which may or may not be found to connect with a deep-seated fascicle of roots. Since the time when I learned to distinguish the two species at a glance in even the poorest herbarium specimens, I have had no opportunity to take up the subject of their vegetative characters. Neither species is in cultivation anywhere so far as I know, and my location is midway between the respective habitats of the two, and far from that of either one. The flowers of both are small, of a dark dull red, without beauty; but the botanical interest of these species should make them desirable wherever the genus is extensively cultivated, whether for botanical or horticultural purposes, though botany and horticulture ought to go more hand-in-hand than they have done.

University of California. *Edward L. Greene.*

## Foreign Correspondence.

### Botanical Gardens at Birmingham.

IN some of the most important of English provincial towns there are pleasure gardens called botanical gardens, for which a price of admission is charged and where a more or less interesting collection of plants is included amongst the attractions of the place. These attractions may vary from a brass band to a company of performing minstrels or a bicycle match. As a rule, the collection of plants scarcely justifies the title of the gardens, and in some there are as few evidences of good horticulture as of botany.

The botanical gardens at Birmingham are, however, a striking exception—the plants, both in-doors and out, being particularly good, both in regard to their variety and cultivation. The gardens are small, occupying only about twelve acres, but their position is a well chosen one. They are on the side of a slope, commanding a view of beautifully wooded country. "On the right is to be seen the village of Harborne, backed by the Warley Woods, and on the left the eye follows the little valley of the Bourn, and beyond are the hills of Bromsgrove Lickey. Harborne was long the residence of David Cox, the painter, but it is strangely altered since the time when he was laid to rest under the Elms in the old church-yard."

The plan of the gardens was prepared by J. C. Loudon, and they were opened to the public about sixty years ago, under the auspices of the Botanical and Horticultural Society of the town. There is a charge for admission, and a string band performs in the afternoons during the summer.

A students' garden is one of the features of the place, where the plants are arranged in their natural orders for the convenience of the students of Mason College, in the town, and others. A similar garden has long been provided at Kew. Students are allowed to gather specimens of any of the plants they wish to examine or preserve. This arrangement is greatly

* "ÆSCULUS PARRYI.—*Æ.* Californicæ affinis, frutex humilis; foliis 3-5-foliolatis; foliolis obovatis obtusis subcoriaceis brevissime petiolulatis subtus cano-tomentosis; floribus brevipedicellatis; calyce campanulato ad medium usque æqualiter 5-fido petalisque extus tomentosis; filamentis validioribus minus exsertis."

appreciated by hundreds of those who visit Kew for purposes of study.

Amongst the most striking of the plants noticed by me recently, when looking over the gardens at Birmingham, the following deserve special mention:

Tree Ferns are well represented, and comprise some unique examples of rare species. They are grown in a tall octagonal house along with Camellias, Lapagerias and other typical greenhouse plants. I mention this fact as conclusive evidence that the Ferns receive ordinary greenhouse treatment all the year round. In winter the temperature frequently falls to forty degrees Fahr. Unless I am very much mistaken some of the Ferns which are growing in this house in perfect health and luxuriance are generally treated as stove or intermediate species. There are *Cyathea princeps*, *C. spectabilis*, *C. funebris* and *C. medullaris* represented by tall-stemmed, large-headed specimens. Cibotiums were equally striking: as were *Alsophila excelsa*, with a stem fifteen feet high; *A. australis*, twenty feet high; *Lomaria gibba*, *Dicksonia squarrosa*, a pair, twenty feet high; *D. antarctica* and *D. Lathamii*. This last is supposed to be a hybrid between *D. antarctica* and the rare *D. arborescens*, a native of St. Helena. Mr. Latham, the curator of the gardens, raised this plant from spores at a time when he had growing together the two species from which it is supposed to have originated. It is a very distinct Tree Fern, quite unlike any other known in gardens. The stem is seven

Fig. 47.—Æsculus Parryi.—See page 356.

feet high, two feet through at the base, and it bears an enormous head of fronds, each about twelve feet long, with large, leathery gray-green pinnules. The base of the rachis is clothed with long silky scale-hairs of a deep golden brown color, a character which led to the plant's being mistaken for *D. chrysotricha*. Young plants show an equally well marked individuality. It is becoming quite evident, to me at any rate, that a large number of Ferns, and especially arborescent Ferns, are cultivated in much warmer houses than they require or even than is good for them. The finest collection of Tree Ferns is probably that in the Brussels Botanical Gardens, where species from all parts, temperate as well as tropical, are cultivated in a large house wherein the conditions are those of a warm greenhouse rather than a stove.

A fine glass structure about 100 feet long by forty feet wide, and about twenty feet high, is used as a promenade and exhibition hall, at Birmingham. Stages run all round the sides, and these are filled with plants, chiefly ornamental, whilst from the roof hang creepers of various kinds. A band stand at one end of the structure is partly hidden by a group of Palms, Musas and other fine leaved plants. The entire range of the stages along one side of this house was at the time of my visit filled with a collection of Fuchsias, some of them trained a little way up the roof, others hanging gracefully over. The effect was particularly good—an irregular wall of masses of flowers all hanging elegantly as Fuchsias only do hang. In addition to such fine varieties as Golden Avalanche, Mrs. Marshall, Earl of Beaconsfield, Mrs. G. Rundell and Monarch, such handsome species as *F. Corymbosa* and *F. arborea* were conspicuous. In another house were some beautifully grown examples of *F. triphylla*, the pretty Mexican species which was brought into notice by Kew some six years ago. It is the species upon which the genus was founded, but so little was known of it that botanists began to suspect that the type of the genus was not a Fuchsia at all! Mr. Latham obtained a plant of it from Kew, as also did many others, but whilst they and Kew have been struggling with the plant in a greenhouse and grown it but poorly, here at Birmingham it has grown very freely, forming perfect specimens two feet through and profusely covered with large clusters of its bright scarlet, long-tubed flowers. The secret of Mr. Latham's success with this plant is stove instead of greenhouse treatment.

*Mitraria coccinea* is grown well as a wall plant in a lofty greenhouse. The brilliant color and elegant form of the flowers of this easily grown plant merit better recognition for it than it receives at present. It is grown in pots at Kew and forms handsome specimens.

*Clerodendron fallax* is exceptionally well managed at Birmingham. As a rule it is straggly and thin in habit, but here it is fully a yard through, thickly clothed with large dark green leaves, whilst each of the eight or ten branches bears a head eight inches through of bright scarlet flowers. The plants continue in bloom at least two months. At Kew there is a white-flowered variety (*C. fallax alba*) of this fine old-fashioned stove plant.

The collection of Orchids comprises not a few choice and rare kinds amongst a fairly comprehensive lot of popular garden sorts. Instead of growing them in houses by themselves, Mr. Latham mixes them with miscellaneous flowering plants and Ferns, an arrangement which enhances the beauty of the Orchid flowers and improves the appearance of the plants.

*Callicarpa purpurea* is splendidly grown by Mr. Latham. Whilst it is hardy enough to grow in a cold greenhouse, this shrub is never seen at its best unless when grown in heat. At Birmingham it occupies the central stage of a house where Gloxinias, *Aristolochia elegans* and *Hoya globulosa* are at home, the Callicarpa forming shrubs six feet through with branches fully four feet long, leafy from base to point, and with a cluster of flowers or small berries in every leaf axil. In autumn the berries will be about the size of Peas and colored bright magenta.

*Platycerium Stemmaria* is a very striking Fern when grown well, as it is at Birmingham, where some large examples occupy a portion of a house devoted to choice Aroids, Crotons, Dracænas, etc. In the greenhouse, along with the Camellias are two enormous masses of *P. alcicorne*. Apparently this species is perfectly happy in a greenhouse. Ouvirandra, Nymphæas, Todæas and other Filmy Ferns, Stapelias, Cacti and some of the most important of economic plants are also in this collection. Altogether the Botanical Gardens of Birmingham must play a not unimportant part in the education of the people of the town, as well as affording a very pleasant resort for leisured people at all times of the year.

Birmingham, Eng. *Visitor.*

# Cultural Department.

## The Endurance of Orchards.

IT is a very common remark that our modern orchards do not live so long as the orchards of our fathers and grandfathers. There is truth in the statement. Those old orchards were usually seedling trees, picked up in the fence corners, planted in sod, sparingly pruned, slow to come into bearing, and to a very large extent ungrafted, and producing little other than cider apples. I was reared in a ten-acre orchard of this sort, and having followed fruit-growing nearly ever since, I think I can explain why our modern orchards are shorter lived than those of our forefathers.

Those old seedling trees, picked up wherever the scattered seeds found a hospitable spot, were rarely transplanted to the orchard until six or seven feet high—which means at least as many years of age. Set out in sod, they re-established themselves slowly and grew slowly, so that few of these orchards came to full bearing in much less than twenty years. In those days there was little market even for good fruit, and but few trees were grafted with the better kinds in cultivation—hardly more than enough for home use. Cider and cider brandy were the objects sought by the orchardist then.

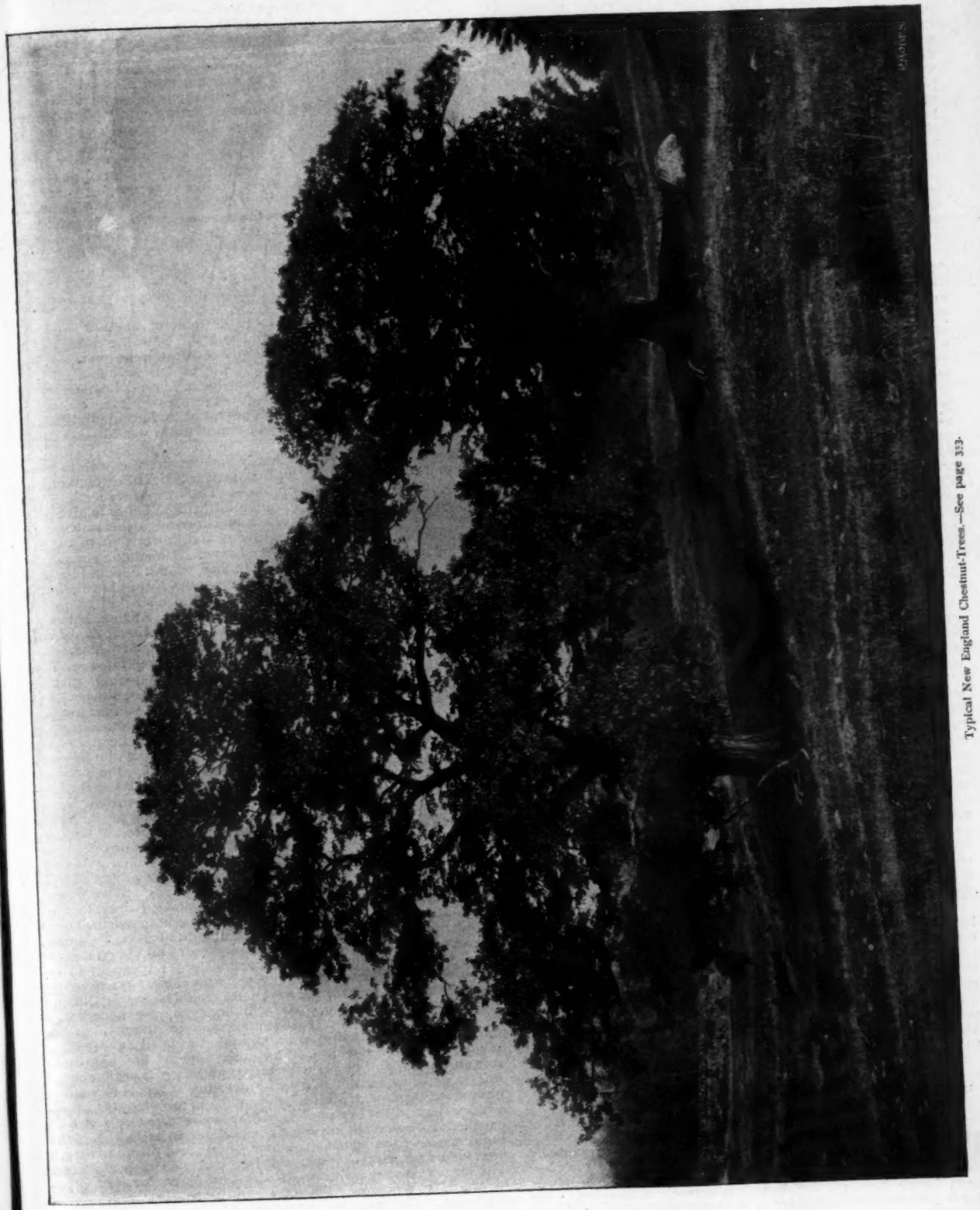
The old-time orchardist was not a skillful pruner; his implement was the axe; but he only pruned to get rid of limbs that were in his way. Land was cheap and the trees were allowed plenty of room. The soil was fresh and they grew thriftily—such wounds as they received healing quickly. Selection had given only the most vigorous of the abundant seedlings a place in the orchard, while the winters had sufficient time, before these were transplanted, to winnow out the weaklings. So the old orchards, started with strong trees, in good soil and widely spaced, grew up with but slight pruning under the very best conditions for a long existence.

Contrast all this with our present method of planting an orchard. Beginning with two or three-year-old trees from a highly enriched nursery, we find nearly all but the few skilled professional orchardists planting these trees in the grass, as of old. The papers are full of advice about pruning fruit-trees, and the jack-knife and saw are allowed free play on these younglings before they have got fairly to growing. The injury in cutting a tree is in direct proportion to the amount of wood removed, relatively to what is left, and it too often happens that the ignorant pruner administers a life-long check to his tree in the first years of its life. Such a tree struggles along feebly, it may be for many years, but at last dies without ever yielding any profit to the planter.

On the other hand, it may be that the would-be orchardist sets his trees in an enriched piece of tilled land. This is right, if his selection of varieties is right. But the ease with which trees can be had from a distance, and the persistence with which new varieties are pressed upon the public, too often lead to a heterogeneous collection of sorts, few of them well suited to the place in which they find themselves. There are very few cosmopolitan Apples. Many sorts are very local, and however fine or profitable in the right spot they are unthrifty in every other. The old orchards were native to the spot and their trees were well winnowed by the seasons before they were admitted to cultivation.

We must admit that the old orchards were vigorous and long lived, and for the times and uses when and for which they were planted, they were profitable. A modified form of the old method still continues in many places. Most of the commercial orchards of Maine are grafted upon seedlings selected and set out as above detailed, and the practice is not confined to Maine. It is in many places, especially in the north, better than purchasing from nurseries, because the stocks are tested for hardiness before the grafting is done. Many of our best market Apples are too tender in Maine to be profitable, unless top-worked upon stocks more hardy than themselves.

This brings one to another reason why orchards in many places, though productive for a while, are not enduring. These orchards consist of sorts not quite hardy enough for the spot where they grow. Top-worked upon native seedlings, they do well for a while; but severe test winters, in conjunction with heavy crops of fruit as they come into full bearing, weaken the vitality of the grafts; and with a hard winter, immediately following a large yield of fruit, the orchard is found in a bad, and often an irrecoverable condition. There is nothing in such a result that should be unexpected to an intelligent cultivator. If he wants a long-lived orchard he must plant only such long-lived varieties as are quite capable of enduring the severest extremes of the locality. But I believe it will often pay sufficiently well to practice the other method, though



Typical New England Chestnut-Trees.—See page 353.

inevitable risks attend it. The orchardists of south-western Maine grow such valuable commercial apples as the Baldwin, the Rhode Island Greening, the Roxbury Russet and the Gravenstein successfully only when top-worked upon hardy native stocks. Handy to Portland and to Boston, these growers have easy access to the best home and foreign markets with their apples, which, when well grown and properly handled, have a quick and sure sale at a high price. Their trees will not be long-lived, but they will live long enough to yield a handsome profit; and as they rarely die all at one time, the orchard can be kept up by replanting, or by successive plantings, so as to make the business continuous. Such orchards, short-lived though they may be, are very much more profitable than their long-lived predecessors. We can still have long-lived orchards by reverting to old methods. In changing from them we have not effected any change in Nature. She will still give us all that she gave our fathers if we will comply with her conditions.

Newport, Vt. *T. H. Hoskins.*

## Our Currants.

THE currant crop should be one of our largest. The market is always good. The demand is never met by the supply. I never fail to obtain eight cents a pound, and this year have marketed all my crop at ten cents. The fruit pays at five cents a pound. The bushes need strong, moist, but not wet, soil. They should be kept clean and in a high state of culture, but they like partial shade. I grow them in the same rows with red Raspberries, alternating the bushes.

The varieties best for market are Versailles and Fay. There is little difference between these, and the preference is for Versailles. This Currant is not easily obtained—that is, the genuine. It is magnificent in bush and bunch. Why Fay ever secured such applause as superior to all others is a wonder. It is hardly distinguishable from the Versailles. The Cherry has a short bunch, some years very short. It is also a comparatively poor cropper, and is not well flavored. The sweetest currant is White Dutch; but when not very well grown it is over seedy and small. White Grape is the first of all currants for the table. It is thin-skinned, not over seedy, large, handsome, with superb bunches, a great cropper, and delicious in flavor.

The currant has the advantage of hanging on the bushes for several weeks, and is in order for the table for at least two months. One should have a few bushes of Prince Albert to lengthen out the season. Of course, if worms are allowed to defoliate the plants, the crop must be gathered very early and used for jelly, or it will sun-burn and sour.

The Crandall is not what it was sold for—a cross of native with foreign sorts. It is a pure native, somewhat improved. But it is half a humbug, after all. The bush lops about, and must be tied to stakes. The size of the currant is only that of a large fruit of the ornamental Missouri Currant grown in our shrubberies. The flavor is pleasant, but no improvement on that of the varieties grown for ornament. Let it be taken for what it is, and appreciated accordingly.

The propagation of the Currant is very easy. Take cuttings a foot length; set these into the soil in a dry place in October or November. Pack down the dirt very tightly and leave them until spring. Then a part will be found to have rooted, while the rest will have calloused and are ready for planting if you desire. In setting such small plants pack the earth very tightly about them. It is the secret of success.

The only enemy the Currant has generally is the well known worm that defoliates the plant. White hellebore dusted on will kill them. The best method of applying is to mix two tablespoonfuls of hellebore in a pail of water with one teaspoonful of kerosene. Riley's emulsion of kerosene is easily made and kept on hand. It is the best way of using it. I apply exactly the same mixture to Rose-slugs. Two generations of worms appear each season, and both must be killed. One of them hatches as the fruit is setting; the other as it is ripening. The hellebore should be applied the last time without kerosene, as it is sticky and helps dust to adhere to the fruit.

Clinton, N. Y. *E. P. Powell.*

## The Water Garden.

PERHAPS none of our wild flowers are more universally appreciated than the Water Lilies, and yet until one has cultivated Nymphæas and has had an opportunity to study them day by day their full beauty is scarcely appreciated; for this is a flower which appears at its best when daintily anchored in a clear pool. It cannot be too often said that in this climate all the Nymphæas and Nelumbiums can be successfully grown in the open air without the aid of glass, and, with the exception of *Victoria regia*, no large estate is necessary, for room may be made in almost any small garden, if it is sunny, for a tank, which, with a little management, may be made a successful water garden.

Last year I noted in Garden and Forest (ii., page 405) an experiment in growing Nymphæas in sunken casks, which answered very well, but this season the natural result is a tank, which, while simply made and inexpensive, quite answers its purpose. An ordinary laborer dug an irregular pit about two feet deep, with slightly sloping sides, and after firming the bottom applied a coating of pure Portland cement, going over it twice, which made it water-tight. Even in light soils, I think a good coating of cement would answer without brick-work. It is well to apply this when the earth is dry, as otherwise cracks may appear in a very dry season. Of course, where permanence is desired, and the expense can be afforded, a tank with brick walls would be best. In as small a tank as mine (ten by twelve feet) it is requisite that there shall be an overflow and a convenient supply of fresh water, also that surface water shall not be allowed to flow into it. The water can be syphoned through the overflow if it be necessary at any time to draw it all off.

When first planted the large amount of manure used will somewhat foul the water, and there will be some rising of impurities, which should be floated out through the overflow; but the water will soon clear, and if the tank is well stocked with gold-fish, silver-fish or sun-fish, there should be no further trouble from impurities, mosquito-germs or algæ. Should it be desirable to hasten the settlement of any accidental turbidity, a spray of a very weak solution of alum would soon cause precipitation.

If the plants used are hardy and few it is as well to plant them out, but if rather numerous it will be more convenient to plant them in boxes or baskets. They are gross feeders and rank growers, and for a small tank it will be better to give only moderate root-room. Of course, one does not in this way secure the greatest development of foliage and flowers, but this is not essential to one's enjoyment always. If æsthetic considerations alone prevailed, a tank the size of mine would be well furnished with, say, two Nymphæas and a Nelumbium; but it is possible to grow a dozen varieties, and also find room for *Papyrus Antiquorum*, varieties of Sagittaria, Alisma, *Aponogeton distachyon*, *Eichornia crassipes*, *Limocharis Humboltii*, etc., all of which are interesting and quite indispensable.

A flower-lover must feel in sympathy sometimes with M. Alphonse Karr's Tulip-amateur, who desired a chair that he might sit down and be alone with his favorite flower. No other spot in the garden so strongly suggests a similar longing as does the water garden. On its border in the morning of a summer's day one finds restful enjoyment in the beauty of the foliage, the varied bearing, form and coloring of the flowers, the fascinating water reflecting the changeful sky, the busy fish active as so many children, the frogs enjoying siestas on the Lily-pads—not nearly so sleepy as they seem—and the varied "small deer" which water attracts. And then the setting of the jewel! At one side, flanked by a Bamboo and Spiræa, are the flag-like leaves of Kæmpfer's Iris, the graceful, quiet flowers being in tone with the surroundings; another side is filled with Cannas, Bamboo and Eulalias, with an undergrowth of Ferns, Primulas, etc. There a jutting point is made by a mass of peat, from which springs a colony of wildlings, and a Dwarf Sumach pendant over the water—a nice bit this. Convenient to the banks I find quiet places where small things, Saxifrages, Primulas, Droseras, etc., are at home in the moist air and the chance of a full supply of water. In an adjacent border I expect to establish an artificial bog connected with the tank, where can be grown many fine things which are troublesome or difficult in an ordinary garden. As will be seen, the accessories of a water-garden are scarcely second in interest to the garden itself, but some care should be used in selecting plants for such a position. The color-tone of the picture is low and quiet, and plants with bright, dazzling flowers should not be used, especially if dwarf-flowering. Cannas nowadays have dazzling flowers, but they are tall and too valuable otherwise to discard for their color. *Caladium esculentum* is also an excellent foliage plant in such a position, but in a small place the buildings give the winds a rotatory motion and the huge leaves are twisted off, so that it can only be grown well in open spaces. The larger Grasses are perhaps the best plants for such a position. Mr. Watson, in his notes from Kew a few weeks since, wrote of "the universal attraction of the aquatic tank," and nothing truer could be said; for it is a remarkable fact that the Lily-pond proves an attraction to every one, young or old, without exception—something which cannot be said of any

other class of plants, however showy or beautiful. Every grower who has been chastened by the average visitor, who, fearing "to be dilated with the wrong emotion," notices only the well known flowers and looks coldly on the unknown treasures, should provide a tank for a certain attraction.

Elizabeth, N. J. *J. N. Gerard.*

## "The King of Lilies."

I AM not aware that the great Himalayan Lily—*Lilium giganteum*—has been previously grown in the open air in this state; it is a stranger to western New York, I have reason to believe, until this season.

My first experience with this Lily dates back to the autumn of 1885, when several flowering bulbs were sent me from England. The gigantic conical bulbs were potted and housed in a cool house over winter and planted in the open in the spring, only to be cut down and killed by an unexpected sharp frost during early May. The following autumn a dozen small bulbs were sent me by a friend in North Wales. These, likewise, were potted and housed over winter, with the exception of three, which were planted late in November in the hardy fernery. The latter all put forth leaves the following spring, showing conclusively that the species is hardy in this climate. The remaining bulbs were also placed in the fernery and the shaded portion of the rock-garden. Of eight of the dozen bulbs which survived, four have just blossomed, the remaining four being strong plants which, unquestionably, will produce flower stalks next season.

The plants have all received a slight winter protection of leaves; and every spring the early projecting crown has been protected by pots or other covering whenever any danger from frost has appeared, this Lily being one of the very first plants to show above ground in spring and being extremely sensitive to sudden cold. The stem begins its ascent early in the season, throwing out the large heart-shaped leaves, which diminish in size as they advance upon the stem, the flowers forming in a great raceme at the extremity of the stalk. Even as a foliage plant, independent of its stately flower-stalk, this Lily, with its huge, glossy leaves, is strikingly attractive, and the leaves remain fresh and green until mid-autumn.

The strange beauty and majesty of the great Himalayan Lily must be seen, however, to be fully realized; and it is to direct the attention of all flower-lovers to one of the grandest of hardy plants that I am prompted to refer to it. Its beauty could only be fully portrayed by a poet. If any flower may be termed regal, this term applies to *Lilium giganteum*. It looks like the inhabitant of a tropical jungle—a sacred flower of the far east, supreme in its stateliness and its grace. Its suave, haunting odor sets me dreaming. Fragrances as of Jasmines, Japanese Honeysuckles and Gardenias; perfumes as of Cascarilla and Sandal-wood; spices as of Sassafras and Clove-Carnation cling to its long, chaste chalice and scent the entire garden in the evening. Then the cernuous poise of its great flower-cluster, nodding from the tall, tapering stalk above the majestic leaves, and the refinement and beauty of the long, trumpet-shaped blooms! A distinct feature of the six-petaled blossom is the penciling of the inner petals, these being exquisitely shaded with purple merging to deep lake, from the extremity of the flower to the flange of the chalice.

The height of the Bamboo-like stalk in the four specimens referred to varies from eight feet three inches to nine feet, the diameter of the thickest stalk exceeding two and a quarter inches. The flowers number from ten to twelve, while the individual blooms measure from eight to nine inches in length. After flowering, the stalk dies down and the old bulb shrivels and dies. Each bulb has thrown out from two to four offsets, which will be lifted and placed where desired in the autumn.

To obtain success with the "King of Lilies," it should have a sheltered and partially shaded position in rich garden soil and leaf mould, and receive abundance of moisture. An application or two of liquid manure will prove of benefit in developing the flowers. It is seen to advantage placed among the native red and yellow Meadow Lilies, which unfold their gay Turk's caps at the same period. A bed of *Lilium giganteum*, grown by themselves or with *L. auratum*, where the latter can be successfully grown, would be a novel and magnificent feature of any garden, more especially if placed against a background of green.

The last raceme of the last flowering plant now stands in a vase in the hall, and fills the entire house with its subtle, penetrating perfume, the odor being exhaled most intensely at night. The garden looks deserted since these giant Lilies have passed, and no blaze of the big Bee Larkspurs nor gay rosettes of the ranks of the Hollyhocks serves to take their place. The "King of Lilies" is individual among hardy flowers.

Rochester, N. Y. *George H. Ellwanger.*

## Orchid Notes.

*Catasetum atratum* is an old but not very well known species, which has been in cultivation since 1838, when it was introduced from Brazil by Loddiges, of Hackney, with whom it appears to have flowered for the first time in cultivation. It is met with here and there in collections nowadays, and quite recently a splendid specimen of it was exhibited at a meeting of the Royal Horticultural Society, as a proof of what a handsome plant it might be made by good cultivation. Fully developed pseudo-bulbs are from nine to twelve inches long, oblong-conical in shape and covered with silvery ribbed sheaths. The young pseudo-bulbs are green, and bear at the summit from four to six broadly-lanceolate deep green leaves twelve to sixteen inches long, which are traversed lengthwise by three conspicuous ribs or veins, and are more or less plaited. The stout glaucous-green, arching scape springs from the base of the young pseudo-bulb and reaches a length of two feet or more, the upper half being furnished with as many as thirty flowers, each of which is about two and a half or three inches across, if fully extended. The sepals and petals are broadly lanceolate-acute, deep green, and thickly covered with blackish purple spots, which are much more numerous on the sepals than on the petals. The thick, fleshy lip is ovate-acute when spread out, sharply recurved at the apex, and having a deep cavity at the base, the sides of which are colored green, with blackish purple spots, while the anterior portion becomes pale creamy yellow. The margin is furnished with a jagged, bristle-like fringe, which is longer and stiffer at the base. The column is green, speckled on each side at the base with purple-brown, and having two pale horns or antennæ passing from the sides in front into the cup of the lip.

*C. atratum* is apparently an easy species to grow, requiring the same treatment as others of the genus. Pots or baskets, with a compost of rough peat and sphagnum, placed over clean crocks, are equally suitable receptacles for it. When the new growth makes its appearance then watering must be regularly attended to, and the frequency of the supplies should be increased according to the rapidity of growth. A tolerably warm and moist house, which can be well ventilated without causing draughts, is well adapted for growing purposes, and although direct sunlight on the plants cannot be recommended with safety for more than a short time in the morning, nevertheless as lightsome a position as possible will be found best for ripening the growths, thus enabling them to store up abundant material for the resting period during the winter months.

London. *John Weathers.*

*Odontoglossum Schliperianum.*—This is one of the most useful and at the same time prettiest of this large genus now in flower, and it deserves special mention, as the present is a very dull time of year for Odontoglossums, and, in fact, for any Orchids. *O. Schliperianum* belongs to the section containing *O. grande* and *O. Insleyi*, and it is difficult to distinguish one from the other when not in flower. *O. Schliperianum* produces its flowers on stout spikes from fifteen to thirty inches in length, and bears from five to fifteen or sometimes more flowers, which are about three inches in diameter. The sepals and petals are bright golden yellow, barred on the basal half with bright chestnut-brown; the lip is lighter in color and barred with lighter bands; the apical half of the sepals and petals are clear yellow, making a flower very much admired.

If flowering with *O. grande* this species might easily be taken for a smaller form of the latter, so much alike are they.

*O. Schliperianum* should be grown on the side-benches of the Cattleya-house, where it will be close to the glass and receive a good amount of sun and air. In watering, care must be taken not to wet the foliage, as this causes the objectionable black spots so often seen on the three species named above. Water given about once a week will amply suffice while the plants are growing, and it should be withheld almost entirely after growth is completed, in which respect they differ from most of the other cool Odontoglossums.

Easton, Pa. *Henry Clinkaberry.*

**Rose Gloire de Dijon.**—With this I send you a few sprays of the old Gloire de Dijon Rose to show what fine buds one can have from this favorite plant all the season. The first flush of bloom in June is so abundant that unless the plants are well cared for and in very good soil many buds fail to develop fully.

But after the first bloom the plants rapidly make new growth, and one can usually find a few good buds at any time during the summer. October frosts only put a stop to their flowering. I have four plants with a southern exposure, which have been established some three or four years, and though somewhat neglected, they prove perfectly satisfactory low climbers. In winter a Russia mat is tacked over each plant, and so far they have proved as hardy as the ordinary Hybrid Perpetuals.

Elizabeth, N. J. *G.*

[The buds are of good size and substance, and from their position at the extremity of the strong shoots they can be cut with long stems, which are furnished with the best of foliage.—Ed.]

## The Forest.

### Notes on the Ligneous Vegetation of the Sierra Madre of Nuevo Leon.—II.

As I begin now to give an account of the forests of the Sierra Madre south of Monterey and of the trees which compose them, I am embarrassed by the conviction that the months spent in exploring that region were quite inadequate to the acquiring of all the facts concerning the species growing on the almost inaccessible steeps of those fearful mountains, or locked up in their interior fastnesses. I can do no more than to communicate what I learned there.

The usually abundant precipitation of rain upon the eastern slopes of this mountain chain ensures their being covered with a forest-growth whose size and density are in direct ratio to the amount of soil covering them. True, the depth of soil is slight, when compared with that covering our northern mountains, where glaciers have wrought in the ice age, and where frost still works to the same end; yet here, somehow, there is maintained a constant verdure, the sight of which is refreshing to eyes which have long rested on the eternal grays and browns of the bare mountains of the northern table-land.

On these fresh slopes and on the broader of the mountain tops *Pinus Montezumæ* finds its northern limit of distribution. It is a valuable tree, eighteen to twenty-four inches in diameter and forty to fifty feet high, and fills in this region the place held by *Pinus ponderosa* in the forests of New Mexico and Arizona. Its cones were seen to be extremely variable, the smaller being ovoid in shape and barely two and a half inches long, the larger oblong and fully six inches.

Beginning at a somewhat lower elevation, about 2,500 feet, but mingling with this species in about equal proportion and of no less size, was found another Pine ("Pl. Mex.," No. 1964), which has not yet been referred to any known species. These two Pines were seen to form some really fine belts of timber.

Of especial interest were belts of *Carya myristicæformis*, covering, largely to the exclusion of other species, certain rocky slopes. In the scantier soil this species makes but a scrubby growth, often no more than a shrub; but in moist and rich cañons it becomes a good-sized tree twelve to eighteen inches in diameter.

*Carya olivæformis* seemed to be restricted to wet cañons and springy places, and to attain to larger dimensions than the preceding.

The lower slopes of these mountains abound in wet cañons, and these are occupied by a dense growth of the following species: *Juglans rupestris* (doubtless this species, though the green nuts were three inches in diameter); *Quercus polymorpha*, attaining a size of two feet by sixty; *Quercus virens*, its maximum diameter three to five feet; *Platanus Mexicana*, a large tree and widely branching; *Fraxinus viridis*, var. *Berlandieri*, perhaps the largest of American Ashes; *Morus urticæfolia*, a small tree; *Tilia Mexicana*, eighteen to twenty-four inches in diameter and forty or fifty feet in height; *Chilopsis saligna*, amid tall trees itself tall but slender; *Ulmus crassifolia*, not large, as on river bottoms; *Planera aquatica; Bumelia lanuginosa*, var. *rigida*, six to eight inches by fifteen to twenty feet; a variety of *Prunus Americana*, *Prunus Capuli*, the largest specimen seen being eighteen inches in diameter and forty to fifty feet high; *Cercis reniformis*, sometimes attaining to a diameter of one foot and a height of forty; *Leucæna pulverulenta*, *Cornus florida*, one foot by twenty-five, and *Staphylea Mexicana*, n. sp., six or eight inches by fifteen or twenty feet.

Several of the above list are found scattered in specimens of inferior size outside of the cañons. There they mingle with *Quercus Grahami*, a small tree most abundant from the lower to the higher slopes, whose bark supplies the tanneries of the region; *Q. oblongifolia*, not common here, and another species of Quercus as yet undetermined, and *Arbutus Texana*, from six to twelve inches in diameter, usually with low heads, with grotesque trunk and branches covered with smooth, white bark.

On the precipitous ledges of lime rock—even arising from the fissures of the great cañon walls or waving their leaves from the sharp mountain crests—are seen numerous specimens of the upland Palmetto, *Brahea dulcis*. In so dry and poor situations the plant seldom exceeds a height of twenty feet; but far to the south in low valleys of the south-eastern part of the state of San Luis Potosí, I have seen it rising to forty or fifty feet and forming close forests.

About the base of the mountains, especially on limestone ledges, associated with *Fraxinus Greggii* and *Heliella parvifolia*, which sometimes acquire the size and habit of small trees, and *Diospyros Texana*, here rather shrubby, we find *Amyris Madrensis*, n. sp., the largest specimens of which met with were seven inches by twenty-five feet, and *Sargentia Greggii*, n. gen., one foot by twenty-five. The foliage of these two is evergreen; and Sargentia, with its large, shining leaves, and yellow, oval fruits an inch long, is an interesting plant. Except in the richer gulches it usually appears here near its northern limit of distribution as a large shrub; but as far south as the state of Vera Cruz and at but slight elevation above the sea I have seen it common in tropical forests as a tall, slender-stemmed tree.

Common in rich valleys among the foot-hills we find *Acacia Farnesiana* and *Acacia flexicaulis*, the former one foot in diameter and the latter one and a half to three feet, both low-branching, round-headed trees. *Ehretia elliptica*, more erect in habit and one to three feet through; *Condalia cuneata*, tree-like in habit, but a very small tree; *Pithecolobium brevifolium*, and occasional specimens of *Sapindus acuminatus*.

The principal shrubs or woody vines noticed in the Sierra Madre are: *Cocculus diversifolius; Berberis gracilis*, in broad clumps ten feet high; *Berberis trifoliolata*, a smaller plant; *Fouquiera splendens*, not abundant here in its eastern limit; *Decatropis Coulteri*, five to fifteen feet high, slender, and with but few branches, very abundant on limestone ledges and seen in similar situations in south-eastern San Luis Potosí, but appearing less common; *Karwinskia Humboldtiana*, here two or three feet high and spreading by its roots in wide clumps, but found in Jalisco twenty feet high and with single stems; *Hiræa macroptera*, extensively trailing over walls, shrubs, etc., and bright during many weeks of summer with profuse yellow flowers; *Hiræa lilacina*, rather rare; *Xanthoxylum Fagara*, fifteen or twenty feet high, often forming thickets, not noticed here, with single stems; *Rhamnus*, sp., seen here as a tall shrub, but in Chihuahua as a small tree; *Coludina Greggii*, reaching twenty feet in height; *Ceanothus azureus*, slender, ten feet; *Ampelopsis quinquefolia*, common and higher on the mountains, its variety *pubescens* of Gray (*A. pubescens*); *Ungnadia speciosa; Dodonea viscosa; Rhus virens*, a large stout shrub, sometimes almost a tree, a handsome evergreen with panicles of pink flowers or scarlet fruits; *Rhus Toxicodendron; Rhus Mexicana* (*Pistacia Mexicana*), observed six or eight inches in diameter and twenty or more feet high, but always with the habit of a shrub, branching at the ground and spreading; *Eysenhardtia amorphioides*, five to fifteen feet high; *Dalea frutescens, var.*, a slender

shrub, six to ten feet high; *Dalea Domingensis*, two or three feet high; *Sophora secundiflora*, about fifteen feet; *Bauhinia lunarioides*, fifteen or twenty feet high; *Mimosa malacophylla*, a horribly hook-spined vine, widely climbing over shrubs; *Rubus trivialis; Cotoneaster denticulata*, eight to twelve feet high, with somewhat virgate stems; *Rosa Mexicana*, low and slender, on cool grassy slopes, under Oaks and Pines; *Philadelphus Coulteri*, on cliffs and ledges; *Nesæa salicifolia*, common along streams; *Garrya ovata*, var., *Abelia coriacea*, on summit ledges; *Randia Xalapinsis*, an erect shrub, ten to twenty feet high; *Chiococca phænostemon*, with wide, shining evergreen leaves, and panicles of white flowers or white fruits, very ornamental, so large and stout a shrub that I expect yet to find it as a tree; *Wyethia Mexicana*, n. sp., a composite shrub three to six feet high; *Forestiera racemosa*, n. sp., stems two to six inches thick, and ten to twenty feet high in clumps; *Buddleia Humboldtiana*, extremely variable in size and character; *Brachistus Pringlii*, n. sp., here about three feet high, further south ten; *Lantana Camara; Lippia lycioides; Lippia macrostachya*, six to ten feet; *Berendtia spinulosa*, n. sp., rooting from fissures of the driest limestone cliffs and spreading over their faces; *Croton fruticulosus*, here a fall shrub; *Bernardia myricæfolia;* and *Stillingia sanguinolenta*, some six feet high, in large clumps by streams.

Charlotte, Vt. *C. G. Pringle.*

## Periodical Literature.

The Blue Grass region of Kentucky is charmingly described by John Burroughs in the *Century Magazine* for July, under the title, "A Taste of Kentucky Blue Grass." It is in truth a taste he gives us—more than a mere glimpse; the soul of the landscape as well as its body has appealed to him, and he transports us for a moment into its generous open spaces and gives us the flavor of its cool winds and luscious vegetation. As he says, the man of the woods and the man of the fields both reside within him, it was, of course, to the latter that this region spoke so attractively. Charming indeed is an opening passage: "A perfect issue of Grass or Grain is a satisfaction to look upon, because it is a success. These things have the beauty of an end exactly fulfilled, the beauty of perfect fitness and proportion. The barren in nature is ugly and repels us, unless it be on such a scale and convey such a suggestion of power as to awaken the emotion of the sublime. What can be less inviting than a neglected and exhausted Virginia farm, the thin red soil showing here and there through the ragged and scanty turf? and what, on the other hand, can please the eye of a countryman more than the unbroken verdancy and fertility of a Kentucky Blue Grass farm? . . . One likes to see the earth's surface lifted up and undulating a little, as if it heaved and swelled with emotion; it suggests more life, and at the same time that the sense of repose is greater. There is no repose in a prairie; it is stagnation, it is a dead level. Those immense stretches of flat land pain the eye, as if all life and expression had gone from the face of the earth. There is just unevenness enough in the Blue Grass region to give mobility and variety to the landscape. From almost any given point one commands broad and extensive views—immense fields of Wheat or Barley, or Corn or Hemp, or Grass or Clover, or of woodland pastures. . . . The Blue Grass region is as large as the state of Massachusetts, and is, on the whole, the finest bit of the earth's surface, with the exception of parts of England, I have yet seen. In one way it is more pleasing than anything one sees in England, on account of the greater sense of freedom and roominess which it gives one. Everything is on a large, generous scale. The fields are not so cut up, nor the roadways so narrow, nor the fences so prohibitory. Indeed, the distinguishing feature of this country is its breadth: one sees fields of Corn or Wheat or Clover of from fifty to one hundred acres each. But the feature of this part of Kentucky which struck me the most forcibly, and which is perhaps the most unique, are the immense sylvan or woodland pastures. The forests are simply vast grassy orchards of Maple and Oak, or other trees, where the herds graze and repose. They everywhere give a look to the land as of royal parks and commons. They are as clean as a meadow and as inviting as long, grassy vistas and circles of cool shade can make them. All the saplings and bushy undergrowths common to forests have been removed, leaving only the large trees scattered here and there, which seem to protect rather than occupy the ground. Such a look of leisure, of freedom, of amplitude, as these forest-groves give to the landscape!

"What vistas, what aisles, what retreats, what depths of sunshine and shadow! The grass is as uniform as a carpet and grows quite up to the boles of the trees. One peculiarity of the Blue Grass is that it takes complete possession of the soil; it suffers no rival; it is as uniform as a fall of snow. . . Sometimes the more open of these forest lands are tilled; I saw fine crops of hemp growing on them, and in one or two cases corn. But where the land has never been under cultivation it is remarkably smooth—one can drive with a buggy with perfect ease and freedom anywhere through these woods. The ground is as smooth as if it had been rolled."

The fertility of this region may well seem marvelous to the dwellers on New England farms—a fertility, as Mr. Burroughs explains, which is due to the old limestone rock "laid down in the ancient Silurian seas. The earth's surface seems once to have bulged up here like a great bubble, and then to have been planed or ground off by the elements. This wearing away process removed all the more recent formations, the coal beds and the conglomerate or other rocks beneath them, and left this ancient limestone exposed. Its continued decay keeps up the fertility of the soil. Wheat and Corn and Clover are rotated for fifty years upon the same fields without manure, and without any falling off in their productiveness. Where the soil is removed the rock presents that rough, honeycombed appearance which surfaces do that have been worm-eaten instead of worn. The tooth which has gnawed, and is still gnawing it, is the carbonic acid carried into the earth by rain-water. Hence, unlike the prairies of the west, the fertility of this soil perpetually renews itself. The Blue Grass seems native to this region; any field left to itself will presently be covered with Blue Grass. It is not cut for hay, but is for grazing alone. Fields which have been protected during the fall yield good pasturage even in winter. And a Kentucky winter is no light affair, the mercury often falling fifteen or twenty degrees below zero."

## Correspondence.

### A Troublesome Grass.

To the Editor of GARDEN AND FOREST:

Sir.—I enclose a sample of coarse Grass which is infesting my lawn. Will you kindly tell me what it is, and how I shall proceed to get rid of it? It has been making a vigorous growth all through June, and although the Blue Grass on the lawn is cut closely every week, this jointed intruder snakes along under it and throws out shoots a yard in length which root at every joint. It seems indestructible, unharmed by the sun of July or the frosts of winter. Is there any hope for my lawn?

Frankfort, Ky. *Mrs. W. T. S.*

[This letter gives a forcible description of some of the bad qualities of the Bermuda Grass (*Cynodon Dactylon*) and the accompanying specimens prove that this is the pest.

Bermuda Grass, sometimes called Wire or Scutch Grass, is a strange combination of the good and bad. In the northern states it is a dwarfed, late-starting grass of no value for forage, and may become one of the worst of weeds, requiring the utmost vigilance to subdue it. In the south it is highly prized for pasturage, as it thrives upon sandy soil under a tropical sun, forming a stiff turf that binds securely the loose earth upon which it grows. Professor Beal, in his work on "Grasses of North America," quotes from Professor Phares, an expert student of southern grasses, as follows: "As a permanent pasture grass I know no other that I consider so valuable as this." Howard says that it is doubtful whether any crop is more valuable in the south than the Bermuda Grass when grown at its best. When we leave the south and reach as far north as Kansas, for example, it has been determined by careful experimentation that this grass is worthless for either pasture or meadow—it is only a weed of the most pernicious sort. When looked at from the weed-standpoint, as it must be in the belt of states between the north and south, it is encouraging to know that it rarely seeds in the United States; but like some other species of plants that rarely mature fruit, the Bermuda Grass has a remarkable way of spreading by its root-stocks, in which tendency it resembles our own Quack Grass. To eradicate the pest from a

Blue Grass lawn there seems to be no other way but to clean the land by digging out and destroying every root and root-stock so far as possible, and then to watch carefully for its second coming and attack it again at its earliest appearance.—ED.]

## Notes.

It is believed that the Hollyhock was brought to Europe from China as early as the year 1573.

About 1,400 species of Orchids, 1,100 of Ferns and 500 of Palms and Cycads are grown in the Botanic Gardens at Kew.

An edition of Mr. George H. Ellwanger's "The Garden's Story" has been published in England with a pleasant preface by C. Wooley Dod.

According to a letter recently published in the *Popular Science Monthly* the finest hand-spun Belgian flax, such as is used in making costly lace, is worth from $900 to $1,000 a ton.

Mr. James H. Laing, of the Messrs. John Laing & Sons, the well known nurserymen, florists and specialists in Begonias, of Forest Hill, London, has sailed for New York on a tour through the United States.

A writer in *The Argosy*, Demerara, says that the blue spikes of the pretty pond-weed, *Eichornia tricolor*, from Brazil, are excellent for cutting. The little flowers fade at evening, but a new crop opens next morning, so that a spike will continue to bloom for more than a week until all its buds are exhausted.

Writing in *Zoe*, Mr. F. H. Vaslit notes the following plants as having escaped from cultivation and become naturalized in the Coast Range Mountains: Garden Chrysanthemums, which seem to be becoming true "weeds," that is, are already "rather troublesome to get rid of"; Fuller's Teazle (*Dipsacus Fullonum*); Mourning Bride (*Scabiosa atropurpurea*); and the larger Periwinkle (*Vinca major*).

The English horticultural journals continue to lament the prevalence of the Lily disease among the Ascension Lilies. In some places not a single flower bloomed this year from a hundred bulbs. This disease has been very deadly in this country and is so still in many places, but near New York this year it seems to have abated and the Lilies in many gardens have proved unusually strong and beautiful.

It is said that since the opening of navigation on the Caspian Sea this spring more cotton has been brought from central Asia to Moscow than during the whole of the year 1889. Experiments are now being made with the Cotton-plant in the Crimean peninsula and in other places along the coast of the Black Sea with seed brought partly from more eastern regions and partly from America.

It is only in very recent years that the name Gardenia has been commonly applied in this country to the handsome flowers for which it is the correct botanical name as well as the one almost invariably used in England. Here they have been most generally called Cape Jessamines, although they come from China and are not botanically Jasminums. Yet the genus was named for Dr. Alexander Garden, of Charleston, South Carolina, who was a valued correspondent of Linnæus.

*Limnanthemum Indicum*, just now blooming, lifts its white, star-shaped flowers, which are about as large as a five-cent piece, only an inch or two above the water. The inside of the petals—that is, their upper side when opened—is covered with fine filaments which stand as thickly as those on the Mrs. Hardy Chrysanthemum, and these give the flower such a light and feathery look that the name "Water Snowflake" would suit it well. It has floating foliage like that of a miniature Nymphæa.

Mr. William W. Lunt, of Hingham, Massachusetts, has sent to this office for inspection a sketch in colors of a remarkably fine variety of *Cypripedium* (*Selenipedium*) *caudatum giganteum* which differs from the type in that the prevailing color is a reddish or bronze-like brown and yellow, instead of dark brown and greenish. The pouch is also more nearly globular, but the striking feature of the plant is its high-colored staminode and the great size of the lower sepal. The entire flower is large. The plant is in a four-inch pot, and has three old growths and three breaks.

The yellow Water Lily which originated with Monsieur Marliac in France and which was named by him *Nymphæa Marliacea chromatella* has proved quite hardy in Bordentown, New Jersey, where it remained all winter in a basin eighteen inches deep on the grounds of Mr. Sturtevant. It is now blooming in several places near this city and it is one of the handsomest of aquatic plants. It is a trifle larger than *Nymphæa odorata*, fragrant, with lemon-yellow petals and orange stamens which intensify the apparent richness of its color. Its foliage resembles that of *N. candidissima* and it flowers continuously from early summer until frost.

A correspondent of the *Gardeners' Chronicle* gives the following as a select list of the finest varieties of Laced Pinks: they are Beauty, a small flower, but very free to cut from; Bayard, a large and full flower, beautifully laced with bright red, a grand variety that laces well, and probably the best Pink in cultivation; Clara, smooth, fine, a beautiful petal, regularly laced with reddish purple; Empress of India, a very distinct variety with rich deep lacing, extra fine; Eurydice and Excelsior, very good; Device, George White, Harry Hooper, rich dark lacing; Jessica, Minerva, and Modesty, a very early variety, with bright rosy purple lacing; Mrs. Waite, small, but very pretty and free, and a charming border variety; and Rosy Morn, a very handsome Pink, with broad lacing.

A correspondent inquires how Professor Smith uses an umbrella with a sack attachment to gather in Rose-chafers. The collecting umbrella had better be specially made. Over an old frame stretch a cover of oiled-silk or linen, and cut out the crown, so that when the umbrella is open there will be a round hole, about six inches in diameter, in the centre. To this opening is sewed a bag about eighteen inches in length, open both ends, but so arranged that the bottom can be drawn together by a string. This bag, which will hang from the bottom of the umbrella when inverted, should also be of oiled-silk or linen, so as not to give the beetles a foothold. To any rough material the insects will cling so closely that they must be picked off to be dislodged, and from a cheese-cloth bag, such as Professor Smith first tried, the beetles crawled for hours afterward. To a smooth surface they cannot cling, and by loosening the string at the bottom of the bag the whole contents can be readily dumped.

In one of his pleasant articles in *The Garden*, a "Gloucestershire Parson" writes with feeling of the ravages among rare plants by collectors: "It is sad to see the depredations which are made upon some of our rarer seaside plants. I have seen ladies—'towrists,' as the villagers generally call them—go down with baskets, trowels and small steps into the beautiful sea caves to carry off from thence huge specimens of *Asplenium marinum*. Now nothing adapts itself so well to culture in a warm house as this Asplenium. It rapidly makes a lovely specimen with its dark green, glossy fronds. But to rob the dripping caves of all their beauty in such a way is really too selfish. Moreover, small specimens always grow better than large ones, so that it is a mistake for the depredators to trouble and burden themselves with baskets and implements and large plants. I believe I still know of caves, as yet untouched by the tourist depredator, where this Fern luxuriates, and spreads its dark green leaves in the shadow of the rock to the soft sea breeze. But ere long every place will be found out."

Dr. Harris, in a paper read before the Pennsylvania Horticultural Society recently, called attention to the fact that some of the most valuable vegetable productions, like the White Potato, the Tomato and the Egg-plant, are the results of development in a family which produces the Tobacco, the Jamestown Weed and the deadly Nightshade; and still more singular is it that edible innocence in a product may be intimately associated with a poisonous element in the plant. Starch-yielding tubers may even be in themselves an association of simplicity and venom, as we find in the Cassava, from which tapioca is obtained, the soluble elements of the tuber being poisonous, and the insoluble starch and pulp edible. In the White Potato we have a Solanum which has poisonous sprouts and fruit, with a valuable and innocent tuber or subterranean root-stock. The poison, solania, is found in the white sprouts of the tuber and in the green seed-ball or fruit, but not in the tuber as prepared for the table by boiling or roasting. Solania is not a powerful poison, and is one of very uncertain strength; still, death has been produced in childhood by eating the balls. Very young tubers and old sprouted ones are unwholesome food, for these contain a fraction of the poison. The Tomato plant contains solania, while the fruit, which has the same unpleasant odor, is free from it. Three deadly poisons, among the most potent of all active vegetable principles, are obtained from some of the *Solanaceæ*—namely, nicotia, from Tobacco; daturia, from Stramonium, and atropia, from Belladonna. One drop of pure nicotia will kill a large dog in a few minutes, and the other two are fatal in minute quantities.